

UPDATE FACT SHEET



Treatability Studies Being Conducted at WAG 7

WASTE AREA GROUP

7

DEFINITIONS AT A GLANCE

REMEDIATE:

Resolve an identified or potential environmental hazard.

WASTE AREA GROUP:

The Federal Facilities Agreement and Consent Order subdivides the Idaho National Engineering and Environmental Laboratory (INEEL) into 10 waste area groups (WAGs) for remedial management. WAGs 1 through 9 correspond to INEEL Site facilities. WAG 10 covers miscellaneous other sites within the INEEL and concerns with the Snake River Plain Aquifer.

TRANSURANIC WASTE:

Waste that contains 100 or more nanocuries of transuranic isotopes per gram of waste. Transuranic isotopes are alpha-emitting radioisotopes with atomic weights greater than 92 and half-lives greater than 20 years.

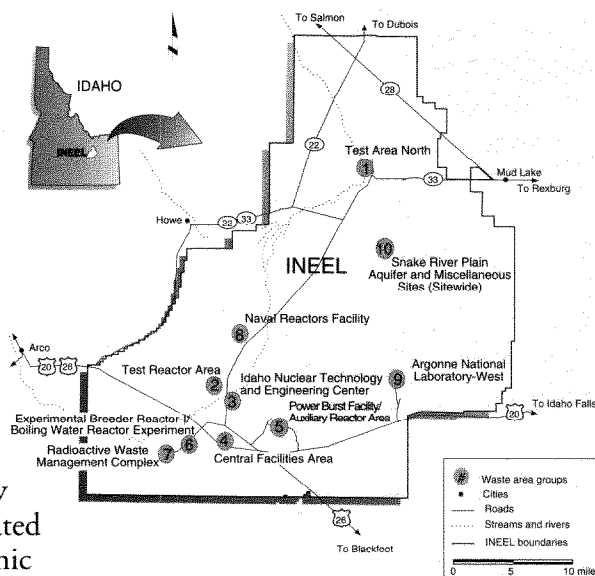
DOE is studying several technologies at the INEEL for *remediating* buried waste and contaminated soil at *Waste Area Group 7*, the Radioactive Waste Management Complex. The studies focus on identifying and evaluating remedial alternatives for mixed *transuranic* and low-level waste buried in the *Subsurface Disposal Area*. The *WAG 7* comprehensive remedial investigation/feasibility study will evaluate the risk and identify appropriate alternatives. The deadline for the *WAG 7 record of decision* is December 2002.

Ultimately, the remedy selected for the SDA will probably be a combination of technologies. For example, one treatment may be used to remove organic contaminants, another applied to bind radionuclides, and a cap constructed over the entire site to contain residual contamination. A staged interim action is being conducted in Pit 9 to provide necessary information on the feasibility of excavating the waste and to provide materials for treatability studies. In addition to the option of excavating the waste, several in situ treatment technologies are now available that may allow remediation of the SDA with lower risk, fewer regulatory complications, and reduced cost. If one or more of these options are selected, some or all of the buried waste would be left in place. Treatability studies will assess the effectiveness and implementability of these in situ treatments and explore treatments for excavated soil.

Five *treatability studies* are being conducted: (1) *in situ* vitrification; (2) in situ thermal desorption; (3) in situ grouting; (4) *ex situ* soil treatments; and (5) surface barrier containment. Testing will demonstrate if a particular treatment mitigates long-term risks associated with the buried waste. Implementation, safety, and cost also will be examined. Some of the studies include large-scale tests on simulated and actual SDA buried waste. Other studies are limited to bench-scale tests on waste and soil retrieved from the SDA.

IN SITU VITRIFICATION

In situ *vitrification* is a thermal treatment that destroys or immobilizes contamination by melting the buried waste and contaminated soil, which then cool, forming a glass-like product that is free of organic material. Electrodes are inserted into the soil. A highly charged current passes between the electrodes, heating the soil and waste. This method effectively treats buried debris and soil contaminated with radionuclides, heavy metals, organic



INEEL ENVIRONMENTAL RESTORATION PROGRAM

GA99 0291

SUBSURFACE DISPOSAL AREA (SDA):

The radioactive waste landfill at the Radioactive Waste Management Complex (RWMC). The SDA includes the pits, trenches, and soil vaults containing organic and radioactive waste.

WAG 7:

The RWMC. The SDA is the primary focus of the remedial investigation/feasibility study.

RECORD OF DECISION:

A legal document signed by the Agencies that outlines the selected remedy for a site, operable unit, or waste area group. The Agencies distribute a proposed plan to get input from stakeholders before signing a record of decision.

TREATABILITY STUDY:

A laboratory evaluation or field test to assess a remediation technology.

IN SITU:

Treating contaminated waste or soil in its current situation and condition (i.e. in the ground).

EX SITU:

Treating contaminated waste or soil after removal.

VITRIFICATION:

Melting materials such as soil and waste into a glass-like product, either in situ or ex situ.

compounds, asbestos, polychlorinated biphenyls, and pesticides. Bench-scale and large-scale tests on simulated waste and a large-scale test in Pit 4 at the SDA are planned.

IN SITU GROUTING

The in situ grouting study is examining (1) grouting for permanent containment and (2) grouting as a pretreatment before excavating the waste. Bench-scale and large scale tests on simulated waste will be conducted.

In situ grouting for permanent containment can provide long-term stabilization of buried waste. Grout injected into the waste penetrates containers and fills voids. Vertical, overlapping columns of grout encapsulate the waste in a stable underground monolith. The grout hardens, reducing contaminant mobility, inhibiting groundwater infiltration, and minimizing plant and animal intrusion. Researchers will evaluate the performance of several grout mixtures.

The same in situ grouting method could be used as a pretreatment before excavating waste. However, a different grout mixture is used because the objective is to confine the waste temporarily during excavation and retrieval, minimizing worker exposure and contamination spread. If the study shows that grout can be used effectively to limit the spread of contamination, grouting might be used if the waste is excavated.

IN SITU THERMAL DESORPTION

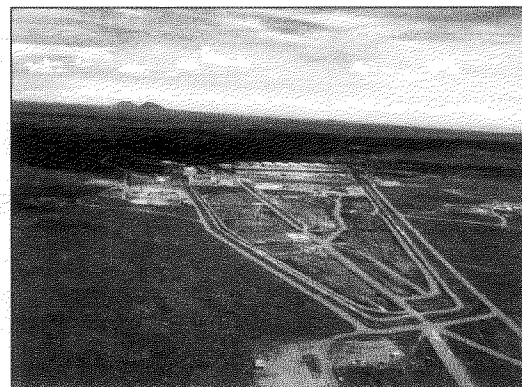
In situ thermal desorption heats contaminated soil and buried waste, vaporizing and destroying most organic compounds. Electrical resistance rods installed in wells drilled through the waste generate the heat. The high temperature destroys nitrate salts and also may chemically alter radionuclides and metals to reduce their migration. The treatment can be used in areas having metals, debris, waste in containers, and soil. The study includes bench-scale tests on simulated waste and SDA samples, a large-scale test on simulated waste, and a large-scale test in Pit 4 at the SDA.

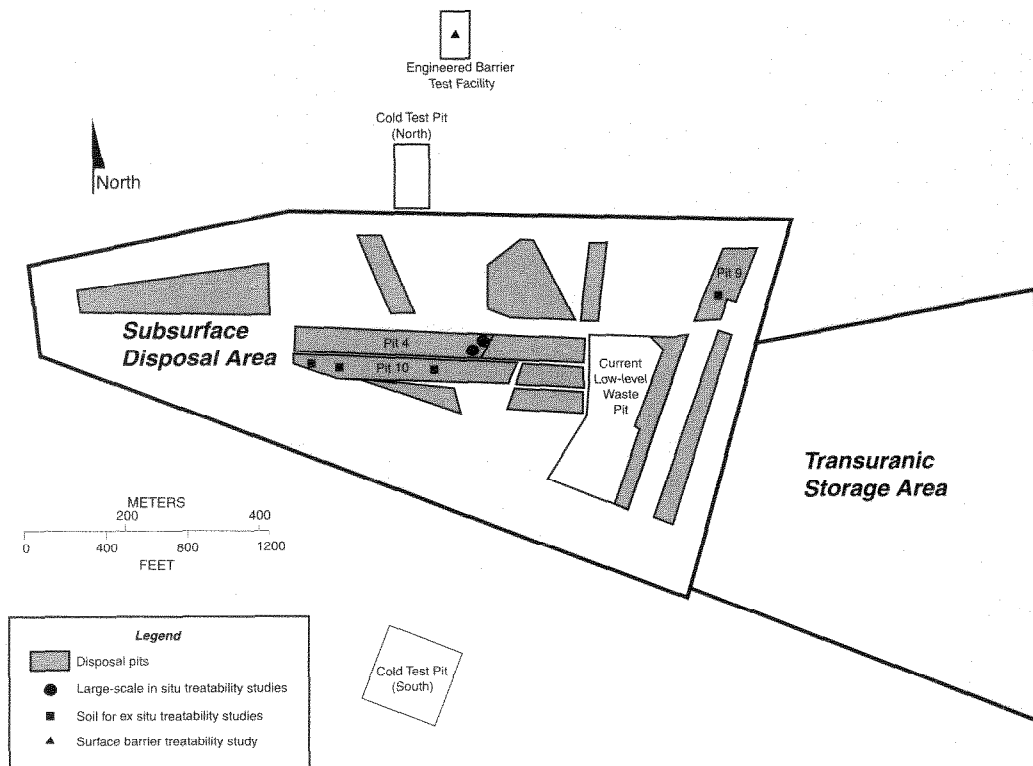
EX SITU SOIL TREATMENTS

Five ex situ technologies are being evaluated for applicability to WAG 7 soil. These technologies offer potential means to segregate and extract transuranic elements and the chemical compounds that are likely to contain transuranics from SDA soil. The technologies also may remove toxic metals. The studies are limited to bench-scale tests using soil collected from the SDA.

SURFACE BARRIER CONTAINMENT

Caps can isolate buried waste from the environment by restricting water infiltration and reducing contaminant migration. The surface barrier treatability study is examining water movement within and beneath various types of soil caps. The tests are being conducted at the Engineered Barrier Test Facility located adjacent to the RWMC. Test plots at the facility are heavily instrumented to provide continuous monitoring. Data from the monitoring will be used to determine if a cover cheaper than the compacted-clay type barrier can be effective at the SDA.





AGENCIES:

Collectively, the Department of Energy (DOE), the Idaho Department of Health and Welfare, and the Environmental Protection Agency.

FUTURE ACTIVITIES

Future fact sheets will provide more details about the treatability studies. Results from the studies will support a complete analysis of remedial alternatives for the SDA. Ultimately, the buried waste and contaminated soil at the RWMC might be treated with one or more remediation techniques.

PUBLIC INVOLVEMENT

Public input is very important to DOE, EPA and the state of Idaho. The *agencies* want to understand your concerns as they continue evaluating Waste Area Group 7. You may request a briefing by calling the INEEL Community Relations Office at (208) 526-4700 or the INEEL's toll-free number at (800) 708-2680.

INFORMATION REPOSITORY/ADMINISTRATIVE RECORD COLLECTIONS

DOE maintains three information repositories throughout Idaho which provide detail on cleanup projects at the INEEL. The information repositories are located at the following addresses.

INEEL Technical Library
DOE Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83415

Albertson Library
Boise State University
1910 University Drive
Boise, ID 83725

University of Idaho Library
University of Idaho Campus
434 2nd Street
Moscow, ID 83843

The Administrative Record may be accessed on the Internet by typing ar.inel.gov on the command line. If you do not have access to the Internet or an Information Repository, you may call the INEEL's toll-free number at (800) 708-2680 to request an environmental restoration document index or a specific document. For the Waste Area Group 7 comprehensive investigation, refer to the Operable Unit 7-13/14 binder in the Administrative Record.

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